

### **REMARKS**

Reconsideration and allowance of this application are respectfully requested in light of the foregoing amendments and the following remarks.

### **STATUS OF THE CLAIMS**

Claims 1-13 are pending.

Claims 4, 5, and 12 are rejected under 35 U.S.C. 112.

Claims 1-4 and 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,032,632 ("Saxton") in view of U.S. Patent No. 6,642,313 ("Kazakov").

Claims 1-4 and 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,642,313 ("Kazakov") in view of U.S. Patent No. 5,032,632 ("Saxton") and U.S. Patent No. 6,329,465 ("Takahashi").

Claims 1, 2, 4, 5, 8-11, and 13 have been amended, Claims 3, 6, 7 and 12 have been cancelled.

Support for amended Claims 1, 2, 4, 5, 8-11, and 13 is found in the Specification on Page 4, Lines 20-25; Page 5, Lines 10-13, and Page 5, Line 19 to page 7, Line 22.

No new matter has been added.

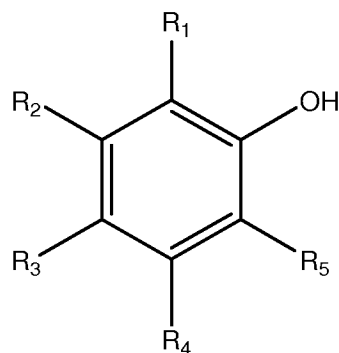
## **THE INVENTION**

The instant invention, as now presented in amended Claim 1, is a pipe comprising:

**an ethylene alpha-olefin interpolpolymer**, wherein said ethylene alpha-olefin interpolpolymer has a density in the range of 0.925 to 0.965 g/cc, a melt index ( $I_2$ ) in the range of 0.05 to 5 g/10 minutes; and

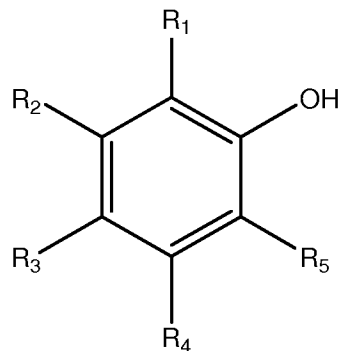
**an antioxidant system**, wherein said antioxidant system consists essentially of;

at least one antioxidant from a first class of antioxidants comprising a hindered phenol corresponding to the formula:



wherein  $R_1$  and  $R_5$  can independently be  $-\text{CH}_3$ ,  $-\text{CH}(\text{CH}_3)_2$ , or  $-\text{C}(\text{CH}_3)_3$ , and  $R_2$ ,  $R_3$ , and  $R_4$  can independently be H, or any hydrocarbon or substituted hydrocarbon group, and wherein said antioxidant from the first class is characterized as being more than five percent soluble in a hexane solution at  $20^\circ\text{C}.$ , and further characterized as having a hydrolyzed product that is more than five percent soluble in a hexane solution at  $20^\circ\text{C}.$ ; and

at least one antioxidant from a second class of antioxidants comprising a hindered phenol corresponding to the formula:



wherein R<sub>1</sub> and R<sub>5</sub> can be -CH<sub>3</sub>, -CH(CH<sub>3</sub>)<sub>2</sub>, or -C(CH<sub>3</sub>)<sub>3</sub>, and R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> can independently be H, or any hydrocarbon or substituted hydrocarbon group, provided that R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are chosen, such that the antioxidant does not contain the moiety Ph-CHR<sub>6</sub>-Ph; or R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are chosen, such that the antioxidant does not contain the moiety Ph-CHR<sub>6</sub>-; and wherein Ph represents a substituted or unsubstituted phenyl ring and R<sub>6</sub> can be H or a substituted or unsubstituted phenyl ring;

wherein said pipe has an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 (±0.1); Chlorine 4.1 mg/L (±0.1); Nominal ORP 830mV; fluid temperature 110°C (±1); air temperature 110°C (±1); pressure 70 psig (±1); flow rate 0.1 US gallons/min (±10 percent).

### **PRIOR ART REFERENCES**

U.S. Patent No. 6,642,313 ("Kazakov") describes a solution polymerization process, wherein at least two polymerization reactors are connected in series or parallel, and the first polymerization reactor operates at a lower temperature. (Column 3, Lines 12-15). The resulting polymer is further compounded, and may contain typical amounts of antioxidants and heat and light stabilizers such as combinations of hindered phenols and one or more of phosphates, phosphites, and phosphonites. (Column 10, Lines 50-61). However, Kazakov fails to mention anything about an antioxidant system consists essentially of a first class of antioxidants, as described in the amended Claim 1 as now presented,

and a second class of antioxidants, as described in the amended Claim 1 as now presented. Furthermore, Kazakov fails to mention anything about a pipe having an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent), as described in the amended Claim 1 as now presented.

U.S. Patent No. 5,032,632 ("Saxton") describes an ethylene vinyl alcohol composition with a specifically selected stabilizer composition. (Column 3, Lines 21-24). The stabilizer composition comprises at least (a) a selected metal salt of a carboxylic acid, and (b) a hindered phenolic antioxidant. However, Saxton fails to mention anything about an antioxidant system consists essentially of a first class of antioxidants, as described in the amended Claim 1 as now presented, and a second class of antioxidants, as described in the amended Claim 1 as now presented. Furthermore, Saxton fails to mention anything about a pipe having an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent), as described in the amended Claim 1 as now presented. Additionally, Saxton teaches away from the instant invention, as now presented in amended Claim 1, because Saxton requires a ethylene vinyl alcohol composition.

U.S. Patent No. 6,329,465 ("Takahashi") describes an ethylene copolymer composition. (Abstract). According to Takahashi", Additives, such as ... antioxidant (e.g., hindered phenols such as Irganox 1010 or Irganox 1076 available from Ciba Geigy Corp.), phosphites (e.g., Irgafos 168 available from Ciba Geigy Corp.),

Standostab PEPQ (available from Sandoz), ... and processing aid, can be incorporated into **the stretch wrapping materials disclosed herein**, though they are not necessary for attaining the desired results of the present invention. The additives should be added in a manner or amounts not detrimental to the substantial adhesion and non-adhesion properties found by the invention." (Column 53, Lines 11-20). However, Takahashi fails to mention anything about an antioxidant system consists essentially of a first class of antioxidants, as described in the amended Claim 1 as now presented, and a second class of antioxidants, as described in the amended Claim 1 as now presented. Furthermore, Takahashi fails to mention anything about a pipe having an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent), as described in the amended Claim 1 as now presented. Additionally, Saxton teaches away from the instant invention, as now presented in amended Claim 1, because Saxton requires a ethylene vinyl alcohol composition.

#### **DISCUSSION WITH REGARD TO SECTION 103(a) REJECTION**

First, Claims 1, 2, 4, 8-11, and 13 are non-obvious over the over U.S. Patent No. 5,032,632 ("Saxton") in view of U.S. Patent No. 6,642,313 ("Kazakov") under 35 U.S.C. 103(a) for the reasons stated below.

Second, Claim 5 is non-obvious over the over U.S. Patent No. 6,642,313 ("Kazakov") in view of U.S. Patent No. 5,032,632 ("Saxton") and U.S. Patent No. 6,329,465 ("Takahashi") under 35 U.S.C. 103(a) for the reasons stated below.

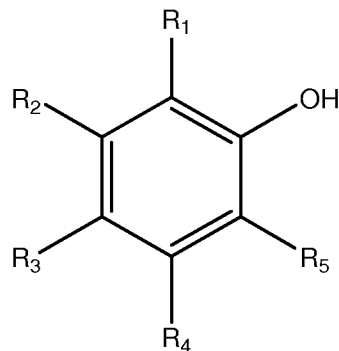
To reject claims in an application under section 103, an examiner must show a *prima facie* case of obviousness. *In re Deuel*, 51 F.3d 1552, 1557 (Fed. Cir. 1995). Furthermore, all words in a claim must be considered in judging the patentability of that claim against prior art. *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). In addition, to establish a *prima facie* case of obviousness, the following three basic elements must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) the prior art reference or references when combined must teach or suggest all the claim limitations; **and** (3) there must be a reasonable expectation of success. MPEP § 2143. Finally, if an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

First, there is no motivation or suggestion to combine or modify the teachings of the above cited references to achieve a pipe comprising:

**an ethylene alpha-olefin interpolpolymer**, wherein said ethylene alpha-olefin interpolpolymer has a density in the range of 0.925 to 0.965 g/cc, a melt index (I<sub>2</sub>) in the range of 0.05 to 5 g/10 minutes; and

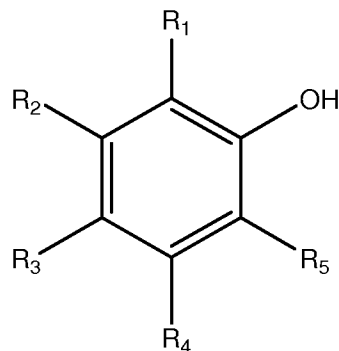
**an antioxidant system**, wherein said antioxidant system consists essentially of;

at least one antioxidant from a first class of antioxidants comprising a hindered phenol corresponding to the formula:



wherein  $R_1$  and  $R_5$  can independently be  $-\text{CH}_3$ ,  $-\text{CH}(\text{CH}_3)_2$ , or  $-\text{C}(\text{CH}_3)_3$ , and  $R_2$ ,  $R_3$ , and  $R_4$  can independently be H, or any hydrocarbon or substituted hydrocarbon group, and wherein said antioxidant from the first class is characterized as being more than five percent soluble in a hexane solution at  $20^\circ\text{C}.$ , and further characterized as having a hydrolyzed product that is more than five percent soluble in a hexane solution at  $20^\circ\text{C}.$ ; and

at least one antioxidant from a second class of antioxidants comprising a hindered phenol corresponding to the formula:



wherein  $R_1$  and  $R_5$  can be  $-\text{CH}_3$ ,  $-\text{CH}(\text{CH}_3)_2$ , or  $-\text{C}(\text{CH}_3)_3$ , and  $R_2$ ,  $R_3$ , and  $R_4$  can independently be H, or any hydrocarbon or substituted hydrocarbon group, provided that  $R_2$ ,  $R_3$  and  $R_4$  are chosen, such that the antioxidant does not contain the moiety  $\text{Ph}-\text{CHR}_6-\text{Ph}$ ; or  $R_2$ ,  $R_3$  and  $R_4$  are chosen, such that the antioxidant does not contain the moiety  $\text{Ph}-\text{CHR}_6-$ ; and wherein Ph represents a substituted or unsubstituted phenyl ring and  $R_6$  can be H or a substituted or unsubstituted phenyl ring;

wherein said pipe has an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent).

There is no motivation because the teachings of the cited references, individually or combined as explained hereinabove, fail to disclose anything about the required combinations of classes of antioxidants present in the antioxidant system of the instant invention. For example, contrary to the Examiner's assertion Office Action, April 15, 2008, Page 7, Paragraph 25), Takahashi does not teach combinations of different antioxidants. In fact, Takahashi discloses Additives, such as ... antioxidant (e.g., hindered phenols such as Irganox 1010 or Irganox 1076 available from Ciba Geigy Corp.), phosphites (e.g., Irgafos 168 available from Ciba Geigy Corp.), Standostab PEPQ (available from Sandoz), ... and processing aid in the context of the stretch wrapping materials. Additionally, there is no motivation because Saxton teaches away from the instant invention, as now presented in amended Claim 1, because Saxton requires an ethylene vinyl alcohol composition.

Therefore, there is no motivation or suggestion to combine or modify the teachings of the above cited references to achieve the pipe of the instant invention, as described in amended claim 1.

Second, even if, *arguendo*, there is a suggestion or motivation to combine the teachings of the above-mentioned cited references, their combined teachings fail to teach each and every required element of the instant invention, as now presented in Claim 1. The combined teachings of the above cited references fail to teach each and every element of the instant invention because none of above



cited references, as explained above, mentions anything about the required combinations of classes of antioxidants present in the antioxidant system of the instant invention. Furthermore, the combined teachings of the above cited references fail to teach each and every element of the instant invention because none of above cited references, as explained above, mentions anything about a pipe having an F time in Jana Laboratories Procedure APTF-2 of at least 1000 hours, under the following conditions: pH 6.8 ( $\pm 0.1$ ); Chlorine 4.1 mg/L ( $\pm 0.1$ ); Nominal ORP 830mV; fluid temperature 110°C ( $\pm 1$ ); air temperature 110°C ( $\pm 1$ ); pressure 70 psig ( $\pm 1$ ); flow rate 0.1 US gallons/min ( $\pm 10$  percent).

Accordingly, the first two requirements to establish a *prima facie* case of obviousness have not been met; therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

Furthermore, if an independent is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F. 2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Claims 2, 4, 5, 8-11, and 13 depend from Claim 1; therefore, Claims 2, 4, 5, 8-11, and 13 are non-obvious.

Accordingly, the above 103 rejections should be removed.

**CONCLUSION**

In view of the forgoing, Applicant respectfully requests that the rejections be overturned and that the instant application be allowed to proceed to issuance.

Respectfully submitted,

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